

CBRN SCBA Use Guide

Training Aid

August 14, 2006



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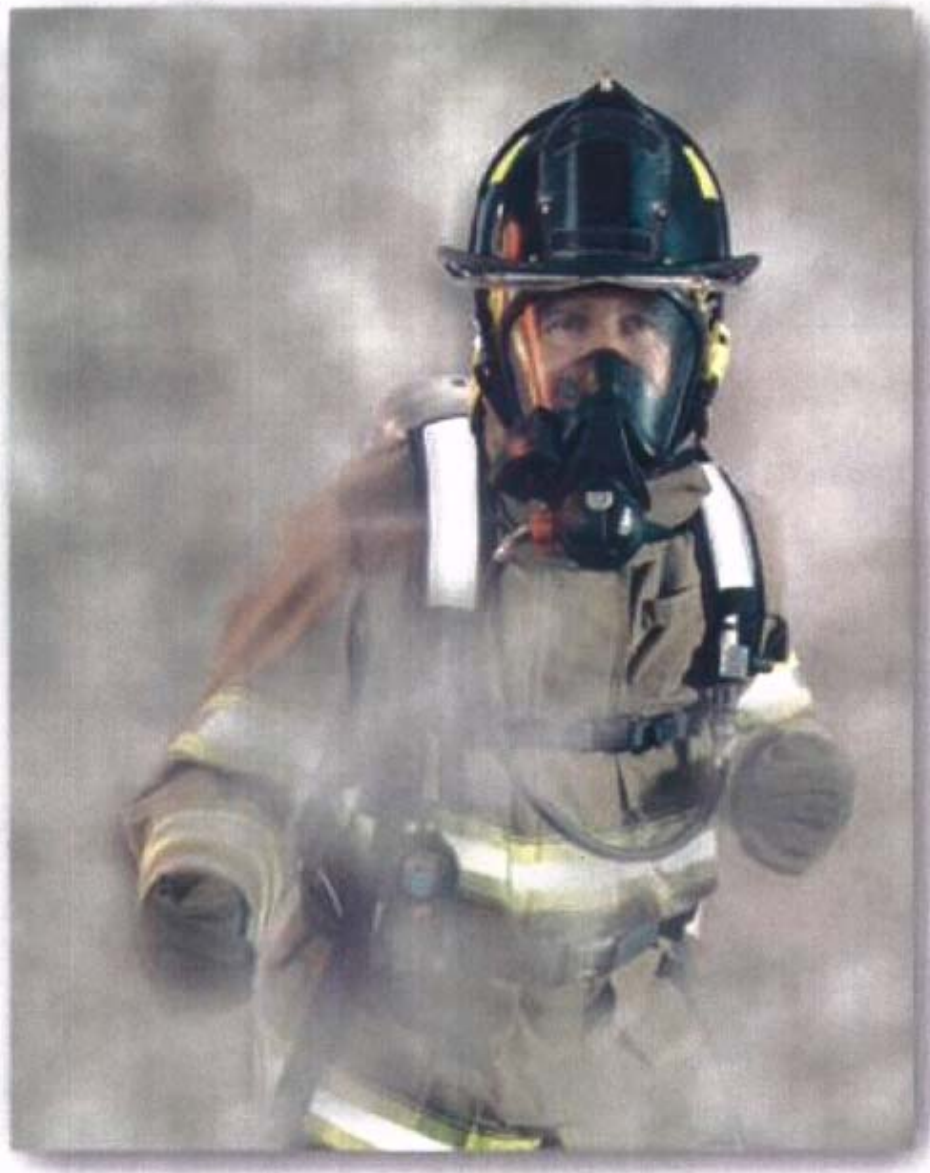


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Firefighter is wearing CBRN SCBA and turnout gear. Demonstrates a type of use designed to show a training or field use posture in support of marketing the respirator. Photography adapted by NIOSH from the original provided courtesy of Mine Safety Appliances (MSA), January 21, 2005.

Front cover. The cover page depicts three distinct workplaces where a NIOSH CBRN SCBA is currently trained with, worn, or projected to be used: 1) federal forensics/hazardous material response units in Level A and B hot zone operations, 2) municipal firefighter in Level D/B in the decontamination corridor, and 3) municipal law enforcement special weapons and tactics officers in a staging area for a bio-terrorism barricaded suspect apprehension. Photographs are courtesy of Terrence K. Cloonan, NPPTL, Raymond V. DeMichiei, City of Pittsburgh Deputy Director/WMD Coordinator and Lt. Ed Allen, National Tactical Officer's Association (NTOA), May, 2005.

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Level A responder conducting handheld air monitoring and incident documentation actions in a CBRN training exercise. The responder is in a fully encapsulated ensemble and wearing an open circuit SCBA with a push-to-talk communications device. Photograph is courtesy of Terrence K. Cloonan, NPPTL, and Raymond V. DeMichiei, Deputy Director/ WMD Coordinator, City of Pittsburgh, PA, May 7, 2005.

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SWAT officers in phased SCBA training and "ON-AIR" while engaging training targets downrange to the right of the picture. In the forefront responder, notice the brass casing discharge and cant of weapon for ease of sight picture attainment while wearing the respirator. Photo is courtesy of Terrence K. Cloonan, NPPTL, LT Ed Allen, NTOA, and SGT Dan Murphy and Don Whitson, Fort Collins Police Department, Colorado, May 2005.

DHHS (NIOSH) Publication No. 2006-XXX

Foreword

The purpose of the *CBRN SCBA Use Guide Training Aid* is to support the training of individual respirator wearers, teams, leaders, supervisors, and incident commanders. It specifies a 7-step process designed to clearly lead a responder through the steps of how to use a NIOSH CBRN SCBA. Training emphasis is placed on the knowledgeable responder learning the location of NIOSH compliance labels, verifying the labels are the correct labels for the assigned use, knowing the user instructions, knowing the specific cautions and limitations, applying the CBRN respirator use life criteria, recognizing use indicators of concern and how to correct them, and developing a decontamination plan prior to or during actual field use of a NIOSH-approved SCBA with CBRN protections (NIOSH CBRN SCBA).

This training aid assists in increasing the availability of CBRN-certified self-contained breathing apparatus (SCBA) for use during a CBRN event to a specified percentage of the professional fire, law enforcement, emergency medical, and emergency management services, when used in conjunction with a respiratory protection program. When properly used, a NIOSH CBRN SCBA protects emergency responders against all respiratory hazards associated with CBRN terrorism and traditional respiratory hazards created by fire, hazardous materials, illicit drugs, or natural disasters. A CBRN SCBA contributes to response preparedness by significantly improving the technical design and protection provided to users of SCBA in the national inventory of respirators.

The training aid is user friendly and fits into the pocket of a responder. It is a durable reference for use with a NIOSH CBRN SCBA training program and can serve as a note-taking device. NIOSH publications are written complements to, and not substitutes for, a required compliant respiratory protection program. The NIOSH CBRN SCBA provides the highest level of emergency response respiratory protection to responders working in the aftermath of pandemic flu, natural disasters, industrial accidents, weapons of mass destruction, specifically CBRN, and illicit drug incidents or for use as entry respirators into all hazardous atmospheres for life saving or event mitigation tasks. Numerous models of SCBA with CBRN protections have been certified by NIOSH since the first approval on May 31, 2002. Certifications of new types of CBRN SCBA continue and this enables NIOSH to maintain the leading edge, with its stakeholders, in the output of certified respirators. A list of NIOSH-certified SCBA with CBRN protections is available on the website at:
<http://www.cdc.gov/niosh/npptl/topics/respirators/cbrnapproved/scba/>.

For more information about NIOSH-certified respirators and use guidelines call 1-800-35-NIOSH or visit the above website.

Director,
National Personal Protective Technology Laboratory

Director,
National Institute for Occupational Safety and Health

Acknowledgements

Terrence K. Cloonan of NPPTL/NIOSH is the lead author.

NIOSH expresses sincere gratitude to Mike Bergman, Heinz Ahlers, Doug Riffle, William Haskell and Jon Szalajda for their technical review comments.

A special thanks to Donna Budniewski of Sci-Tek Environmental Services, Inc., and Amanda Ford of EG&G Technical Services, Inc. for editorial and graphics support.

The City of Pittsburgh, Office of the Mayor, Bureau of Fire, Emergency Management Agency/Homeland Security, under the direction of Raymond V. DeMichiei and assisted by Andrew R. Hower, are deeply appreciated for their invitation, support, and public comment.



Photographs depicts a firefighter ladder truck CBRN gross decontamination process showing responders emerging from a hot zone not visible on the right and entering a high volume-low pressure water spray prior to continuing on to the technical decontamination stations. Responders are in Level B with visible SCBA and extended arms while performing a 360 degree circle before leaving the spray. Photo is courtesy of Terrence K. Cloonan, NPPTL/NIOSH, Mr. Chuck Urban, NIOSH, and Raymond V. DeMichiei, Deputy Director/ WMD Coordinator, City of Pittsburgh, PA, May 2005.

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Law enforcement emergency response team (ERT) in Level B training, circa 2000. Red smoke simulated a CBRN weapons release. Photograph is courtesy of Terrence K. Cloonan, NPPTL/NIOSH and Scott Health and Safety.

Step 1 LOCATE THE LABELS *

Adhesive Labels

Back frame assembly with affixed CDC NIOSH CBRN agent approved label, NIOSH abbreviated harness label and SEI compliance label showing certification to NFPA 1981. The three required adhesive labels consist of **1** a NIOSH harness assembly label, **2** a NFPA 1981 compliance label and **3** a NIOSH "CBRN Agent Approved" label. A fourth label is a standard-size paper label located in the User Instructions **4**. The three adhesive labels can be located anywhere on the harness assembly and can be any font size. The words are required to be visible and easily read. NIOSH CBRN Agent Approved labels are black and white. All four labels are required for NIOSH CBRN SCBA certification. Figure 1 below shows all three adhesive labels indicated by yellow circles with the numerals 1, 3, and 2 respectively. On the digital photography, yellow circles with the appropriate numbers are used as visual cues throughout the text to alert the reader to the specific location of a NIOSH or NFPA label.



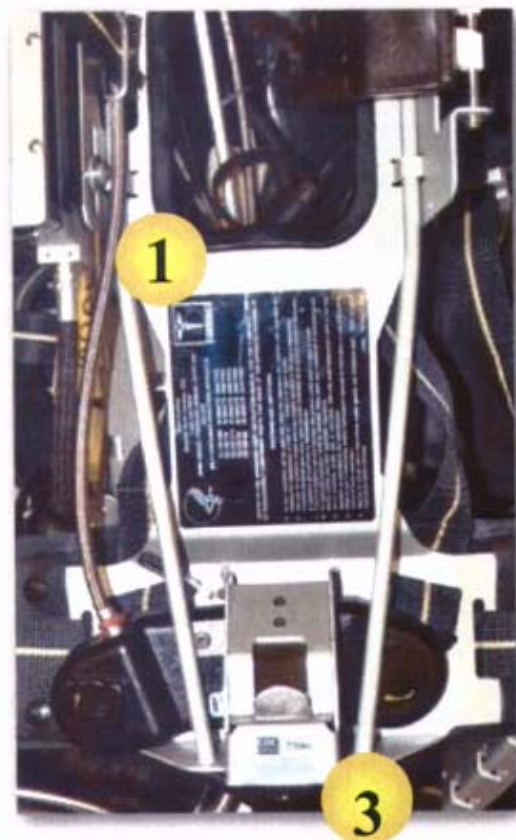
Figure 1. Photograph depicts the location of three NIOSH CBRN SCBA compliance adhesive labels: 1) NIOSH harness label, 2) NFPA/SEI 1981 compliance label, 3) NIOSH CBRN Agent Approved label. Photo is courtesy of Ken Williams, NPPTL/NIOSH, and Michael L. Swofford, Interspiro Inc., 2002.

* Note: The yellow highlighted numbers appearing in the text, of each section (for example **1**, **2**, **3** and **4**), correspond to the yellow highlighted numbers which ¹ appear in photos and labels of that section.

Step 2 VERIFY THE LABELS

1 NIOSH Traditional Back Frame and Harness Assembly Label (Figure 2).

This label can be any color or font size, but must be readable and affixed. It confirms that the SCBA has met the first tier of CBRN protection certification-traditional 13F approval. It lists the approval numbers, the product name, the time duration, and the working pressure of the SCBA that the harness assembly is approved to be used with. It also lists the industrial or traditional Cautions and Limitations in addition to the administrative information identifying the manufacturer of the SCBA. Without this label the first tier of the CBRN protection is not verified. Next step is to look for the NFPA 1981 compliance label. It is a label that incorporates the logo of the Safety Equipment Institute, SEI. SEI is a contract laboratory for NFPA and currently issues compliance labels to products meeting the NFPA 1981, standard, current edition in effect.



Note: the number 3 in the yellow circle will be positioned up in the photograph next to the small Scott CBRN label. For the purposes of Word software, the 3 cannot be positioned correctly.

Harness assembly with NIOSH label and CBRN label visible. Photo is courtesy of Terrence K. Cloonan, NPPTL/NIOSH and Leslie Murphy, United States Capitol Police (USCP), Washington, DC, January, 2006.

 <p>INTERSPIRO, INC. 31 BUSINESS PARK DRIVE, BRANFORD, CT 06405 PHONE (800) 468-7788</p> <p>SPIROMATIC/SPIROLITE 9030, 9030, 4530, 4515 OPEN-CIRCUIT, PRESSURE DEMAND, ENTRY AND ESCAPE SELF-CONTAINED BREATHING APPARATUS OR COMBINATION SELF-CONTAINED BREATHING APPARATUS AND SUPPLIED AIR RESPIRATOR</p> 			
TC-13F-132	SPIROMATIC/SPIROLITE 4515	30 MINUTE	2216 PS.I.G.
TC-13F-133	SPIROMATIC/SPIROLITE 4530	30 MINUTE	4500 PS.I.G.
TC-13F-213	SPIROMATIC/SPIROLITE 9030	45 MINUTE	4500 PS.I.G.
TC-13F-197	SPIROMATIC/SPIROLITE 9030	60 MINUTE	4500 PS.I.G.
TC-13F-199	SPIROMATIC/SPIROLITE 9030	60 MINUTE	4500 PS.I.G.
W/SUIT VENTILATION			
<p>CAUTIONS AND LIMITATIONS: (REFER TO THE APPROVED USER INSTRUCTION MANUAL FOR THE COMPLETE LIST OF SUBASSEMBLY COMPONENT PARTS THAT MAKE UP THE APPROVED ASSEMBLY)</p> <p>1. Air line respirators can be used only when the respirator is supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher gases.</p> <p>2. Use only the pressure ranges and hose lengths specified in the user's instructions.</p> <p>3. Contaminated parts which have not been evaluated as air cylinder sources in flammable or explosive atmospheres by MSD/NALCO.</p> <p>4. Failure to properly use and maintain this product could result in injury or death.</p> <p>5. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSDA, CGA, and other applicable regulations.</p> <p>6. Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.</p> <p>7. Refer to user instructions, and to maintenance manuals for information on use and maintenance of these respirators.</p> <p>8. Source or critical user instructions and to specify for use in GHS apply. Refer to instruction manual before donning.</p>			

Figure 2. Field use example of a NIOSH traditional back frame and harness assembly label 1 for CBRN protection.

Step 2 VERIFY THE LABELS

2 SEI Certified Model NFPA 1981 Label (Figure 3)

This label can be any color or font size as well, as long as it is readable, affixed with no evidence of destruction, and reads appropriate NFPA language. It states the SCBA has met the requirements of NFPA 1981, "Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service," XXXX Edition. Without the NFPA/SEI label the second tier of the NIOSH CBRN protection is not verified. Look for this label and know that when it is visible the SCBA, as a system, has met the voluntary requirements of the cited National Fire Protection Association (NFPA) standard. Finally look for the NIOSH CBRN Agent Approved label 3. It is a label that is used to incorporate the CDC logo and the NIOSH logo. Recent new labels only use the NIOSH Logo.



Figure 3. Sample SEI Certified Model NFPA 1981 (1997 EDITION) Label 2.



Harness assemblies showing NIOSH label and SEI label. Note the administrative number "182" assigned by the using organization. Photo is courtesy of Terrence K. Cloonan, NPPTL/NIOSH and Mr. Leslie Murphy, United States Capitol Police (USCP), Washington, DC, January, 2006.

Step 2 VERIFY THE LABELS

3 NIOSH CBRN Agent Approved Label (Figures 4, 5, 6, and 7)

Verify that the CDC NIOSH CBRN Agent Approved adhesive label is on the SCBA back-frame! If the label is scratched or unreadable, conformation of CBRN protection should be made with the manufacturer or NIOSH.

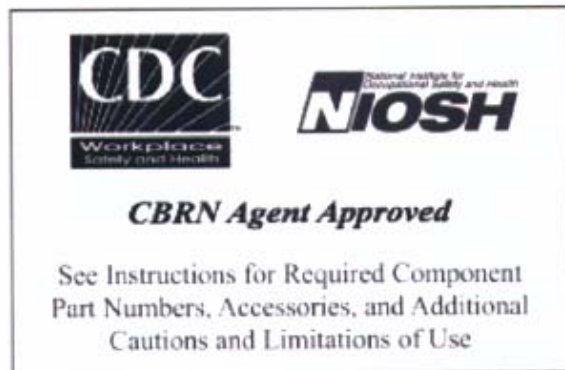


Figure 4. Example of a CDC NIOSH CBRN Agent Approved adhesive label 3.

The same style of label may say “Retrofit” if the SCBA was a previously deployed industrial or NFPA-compliant* SCBA, which was later upgraded to CBRN compliance.

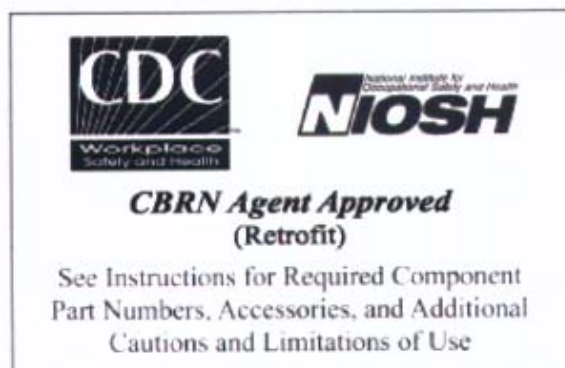


Figure 5. Example of a CDC NIOSH CBRN Agent Approved Retrofit adhesive label 3.

*NFPA-compliant refers to the National Fire Protection Association 1981 standard on open circuit, self-contained breathing apparatus for fire and emergency services, current edition in effect, at time of NIOSH CBRN approval.

*Step***2** VERIFY THE LABELS

If the NIOSH-certified SCBA with CBRN protections you are working with was approved after December 5, 2005, the harness assembly NIOSH CBRN label will be identical to Figure 6 below.

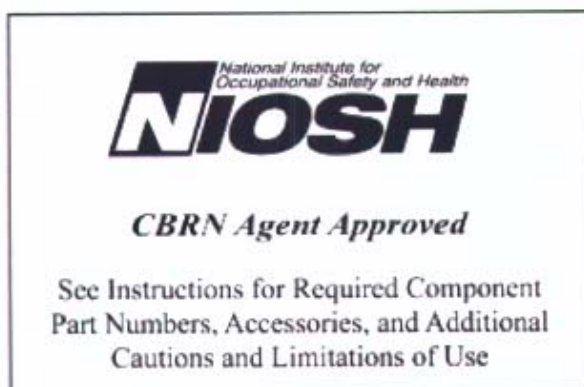


Figure 6. Example of a NIOSH CBRN Agent Approved adhesive label, minus the CDC logo 3.

If the field deployed SCBA has been upgraded/retrofitted to NIOSH CBRN compliance by use of a NIOSH-approved retrofit kit applied by the manufacturer, the NIOSH CBRN Agent Approved adhesive label will contain the word RETROFIT with no parenthesis, in addition to the standard NIOSH logo and additional instructions. See Figure 7 below.

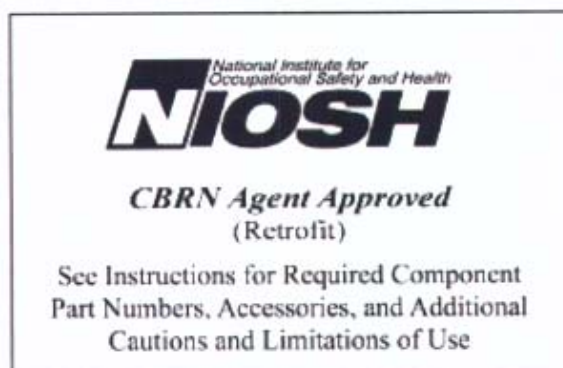



Figure 7. Example of a NIOSH CBRN Agent Approved Retrofit adhesive label, effective December, 2005 3.

Step 2 VERIFY THE LABELS

4 Paper Label (Figure 8)

Verify that your CBRN SCBA is assembled only with the parts listed in the NIOSH matrix-style approval label as shown below. It is a separate paper insert or binded page included with the operations manual/technical manual/user instructions (UI). This paper label is required to have the HHS logo, the NIOSH logo and the NIOSH CBRN Agent Approved label. The CBRN Agent Approved label on this paper matrix label shall match the CBRN label on the backframe.









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**OPEN-CIRCUIT, PRESSURE DEMAND, CBRN,
COMPRESSED AIR, SELF-CONTAINED BREATHING
APPARATUS**

THESE RESPIRATORS ARE APPROVED ONLY IN THE FOLLOWING CONFIGURATIONS:

RESPIRATOR COMPONENTS

PROTECTION	AIR TREATMENT	ALTERNATE VALVE ASSEMBLY	ALTERNATE INTERMEDIATE PRESSURE HOSE	ACCESSORIES	CAUTIONS AND LIMITATIONS
<div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>NIOSH CBRN 301 (not listed)</p> <p>NIOSH CBRN 302 (not listed)</p> <p>NIOSH CBRN 303 (not listed)</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>NIOSH CBRN 301 (not listed)</p> <p>NIOSH CBRN 302 (not listed)</p> <p>NIOSH CBRN 303 (not listed)</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>NIOSH CBRN 301 (not listed)</p> <p>NIOSH CBRN 302 (not listed)</p> <p>NIOSH CBRN 303 (not listed)</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>NIOSH CBRN 301 (not listed)</p> <p>NIOSH CBRN 302 (not listed)</p> <p>NIOSH CBRN 303 (not listed)</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>NIOSH CBRN 301 (not listed)</p> <p>NIOSH CBRN 302 (not listed)</p> <p>NIOSH CBRN 303 (not listed)</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>NIOSH CBRN 301 (not listed)</p> <p>NIOSH CBRN 302 (not listed)</p> <p>NIOSH CBRN 303 (not listed)</p> </div> </div>

1. PROTECTION

NIOSH CBRN 301 (not listed)

NIOSH CBRN 302 (not listed)

NIOSH CBRN 303 (not listed)

2. CAUTIONS AND LIMITATIONS

NIOSH CBRN 301 (not listed)

NIOSH CBRN 302 (not listed)

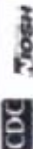
NIOSH CBRN 303 (not listed)

3. CAUTIONS AND LIMITATIONS (CBRN)

NIOSH CBRN 301 (not listed)

NIOSH CBRN 302 (not listed)

NIOSH CBRN 303 (not listed)



NIOSH
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Occupational Safety and Health

NIOSH CBRN Agent Approved

See Instructions for Respirator Use and Maintenance for
Procedures, Precautions, and Limitations

Figure 8. Example of a NIOSH CBRN SCBA matrix-style approval label 4.

Step 3 KNOW THE USER INSTRUCTIONS

The Use/User Instructions (UI) are included with every purchase of a new CBRN SCBA and typically include copyrighted guidance on:

1. Location of NIOSH labels and unique parts labeled "CBRN" by the manufacturer and recommended/mandatory training requirements
2. Description of respirator. Pre-use, in-use, and termination of use checks
3. Donning and doffing
4. Fit-testing and user seal checks
5. Unit assembly and warranty statements
6. Air cylinder inspection
7. Cautions and limitations and manufacturer warning statements unique to each respirator model
8. Inspection checklists
9. Replacement parts
10. How to verify that the hydrostatic test date on the cylinder is current
11. Regulator function (both first stage and second stage regulators)
12. Function of all end-of-service time-indicators (EOSTIs)
13. Function of heads up display (HUD)
14. Inspection of hose integrity for damage and tight hose connections
15. Function of personal alert safety systems (PASS) if present
16. Function of air hatches or compact demand valves, or other specific SCBA air exchange features related to current or next generation technology
17. Exchangeability of compressed air cylinder and neck valve assemblies supporting interoperability of like SCBA cylinders or other components



Photograph depicts a law enforcement team leader conducting a CBRN SCBA facepiece negative pressure user seal check while in a Level B training posture. Courtesy of Terrence K. Cloonan, NPPTL/NIOSH and Mr. Leslie Murphy, United States Capitol Police (USCP), Washington, DC, January

See Appendix A (Air-Hatch Label Call-Out) and Appendix B (Mask-Mounted Regulator Call-Out) for common terminology that identifies generic components of a typical NIOSH CBRN SCBA.

Step 4 KNOW THE CAUTIONS AND LIMITATIONS

Background

The administrative notes section of a paper NIOSH matrix-style approval label consists of three parts of written information.

The first part is a section titled 1. *Protection*. It outlines the approved protection acronyms recognized by NIOSH in the formal approval letter. SC, PD, and CBRN are examples of the official protection acronyms and stand for self-contained (SC), pressure demand (PD), and chemical, biological, radiological and nuclear (CBRN). These are protection ratings and are normally defined as a type of protection or a level of protection. "Type" refers to the protection against a different contaminant such as a CBRN contaminant. "Level" refers to a different level of protection defined by a change in the type of facepiece or air supply capacity. PD and SC are levels of respirator protection.

The second section is titled 2. *Cautions and Limitations*. These are the traditional industrial cautions and limitations that apply to the SCBA when it is used in structural firefighting or isolated hazardous material responses.

The third and final section is 3. *Cautions and Limitations: CBRN*. These are the additional limitations that are mandatory for use in a CBRN response. The three administrative notes sections should always be trained on in advance. CBRN SCBA are respirators, just like closed circuit SCBA, gas masks, powered air-purifying respirators, or half masks are respirators. With the use of sound available respirator selection logic, use life factors, and training on adherence to the identified cautions and limitations, workers have a greater probability of staying fully protected. Characterized IDLH values are considered one of the primary respirator selection factors. If site is uncharacterized, default to maximum protective posture afforded by the use of a NIOSH-certified SCBA, with CBRN protections.



Responders in hazard zone transition area. Photo is courtesy of Terrence K. Cloonan, NPPTL, and Raymond V. DeMichiei, Deputy Director/WMD Coordinator, City of Pittsburgh, PA, 2005.

Step 4 KNOW THE CAUTIONS AND LIMITATIONS

Industrial Use

The following NIOSH cautions and limitations appear in Section 2 of the CBRN SCBA matrix-style approval label and apply to industrial and CBRN use:

Electrical

"I" Contains electrical parts, which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA/NIOSH.

Proper Use

"J" Failure to properly use and maintain this product could result in injury or death.

OSHA/MSHA Use/Fit Tested

"M" All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.

Parts

"N" Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.

User Instructions

"O" Refer to user instructions (UI), and/or maintenance manuals for information on use and maintenance of these respirators.

Other

"S" Special or critical UI and/or specific limitations apply. Refer to UI before donning.



Technical decontamination station depicting a Level A responder with hardhat, being spot decontaminated by a Level B responder under training conditions. Photo is courtesy of Terrence K. Cloonan, NPPTL, Jack Hagerty, NIOSH, and Raymond V. DeMichiei, Deputy Director/WMD Coordinator, City of Pittsburgh, PA, 2005.

Step 4 KNOW THE CAUTIONS AND LIMITATIONS

CBRN USE

CBRN SCBA are respirators. Responders use the phrase SCBA to mean a breathing apparatus or Air-Pak and the words "gas mask" or "respirator" to mean a negative pressure air-purifying respirator or some other type of respirator, besides a SCBA. In technical terms, both an SCBA and a gas mask are defined as respirators. Per 42 CFR Part 84, paragraph 84.2, (aa), a respirator is defined as "any device designed to provide the wearer with respiratory protection against inhalation of a hazardous atmosphere.

The following NIOSH cautions and limitations appear in Section 3 of the CBRN SCBA matrix-style approval label (see Step 2) and, along with the industrial use limitations just described, all apply specifically for use in CBRN environments.

PPE Required

"Q" Use in conjunction with personal protective ensembles that provide appropriate levels of protection against (CBRN agent) dermal hazards.

Delayed Effects

"R" Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death.

Handling and Decon

"T" Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the SCBA after decontamination.

CRUL = 6 Hours

"U" The respirator should not be used beyond six hours after initial exposure to chemical warfare agents to avoid possibility of continued agent permeation.

(Note: *Respirator* means the entire SCBA assembly, to include facepiece/mask, harness assembly, removable regulator, high pressure and low pressure hose lines, cylinder, and any other authorized component or subcomponent of the CBRN SCBA. Use beyond the six-hour mark is not suggested and further use could lead to increased risks in occupational safety and health and possibly death. Ideally, at the five-hour mark, egress from the site and entry into the decontamination corridor should occur. The SCBA hardware disposed before six hours of continuous exposure).

Step 4 KNOW THE CAUTIONS AND LIMITATIONS

Dermal Protective Suits

CBRN SCBA encapsulated by a "protective suit," in a Level A type or NFPA vapor-protective clothing ensemble, assumes the protective qualities of the suit material and interfaces until that suit is compromised or doffed.

Protective ensembles certified to NFPA 1991 standard on vapor-protective ensembles for hazardous materials emergencies, 2005 edition and NFPA 1994 standard on protective ensembles for chemical/biological terrorism incidents, 2001 edition (Class I & 2) are recommended for use in a hazardous environment requiring a CBRN SCBA.

The NFPA 1994 standard is undergoing major revision for the upcoming new edition. A complete list of NFPA compliant ensembles can be located on the Responder Knowledge Base (RKB) web site <http://www.rkb.mipt.org/>.

Once a Level A type suit is compromised, evacuate the contaminated site, and then commence doffing of the suit. Always remove the CBRN SCBA last. Remember, CBRN Agents are most likely to expose the responder through the inhalation route of exposure and thus the respirator plays a critical role in protecting inhalation route. It is the most severe route of exposure because there is no immediate way to remove the contamination. Use of CBRN SCBA will provide the highest level of respiratory protection to the user in a Level A suit, in the event of protective ensemble wear-and-tear abrasions, accidental rips, or collateral damage from a secondary device detonation. If components of the CBRN SCBA are covered by a certified CBRN protective suit or material, decontamination actions are expected to be limited to the suit with precautionary spot decontamination of the SCBA, as necessary. The use life for a SCBA that is protected in a Level A suit does not start until that SCBA is contaminated with chemical warfare agent (CWA). Once CWA have contaminated a SCBA, they have the potential to generate penetration and permeation characteristics that can compromise the entire SCBA air-pressure boundary of the respirator, regardless of the point of contamination on the SCBA. Parts of the SCBA that are protected are not recommended for re-use, once the entire SCBA, or any part of the SCBA, has been determined contaminated. A single six-hour use of the CBRN SCBA provides the highest level of protection to the civilian emergency responder. Any continued use beyond that sixth hour start time will contribute to an increased level of exposure risk. Respirators should remain on the wearer, as well as casualties, until the appropriate control measures confirm airborne hazards are below permissible exposure limits/recommended exposure limits (PEL/REL). Repeatable detection of CWA will aid in determining fully contaminated, partially contaminated, or clean SCBA.



Command and control directives from Level B responders to a Level A responder in hazard zone transition area. Photo is courtesy of Terrence K. Cloonan, NPPTL, and Raymond V. DeMichiei, Deputy Director/ WMD Coordinator, City of Pittsburgh, 2005.

Step 5 APPLY THE CBRN RESPIRATOR USE LIFE (CRUL)

CBRN Respirator Use Life (CRUL) is the maximum time a specific type of CBRN respirator can be safely used after confirmed contamination of the respirator in an unknown, IDLH, greater than IDLH, or oxygen deficient/displaced atmosphere. This time is based on a given use time value specified in the cautions and limitations. The CRUL value for a CBRN SCBA is six hours. CBRN SCBA hardware, minus the cylinder, contaminated with a CWA in vapor, aerosol, or liquid form, has an in-use life of *six continuous hours*, beginning at the time of contamination. The onset of CWA contamination is determined by using qualitative or quantitative detection methods in the field and by laboratory analysis of SCBA removed from the site. See the NIOSH CBRN SCBA User Guide for specifics related to toxicology values based on current Acute Exposure Guideline levels (AEGL) and NIOSH Chemical Agent Emergency Response Cards. Current examples of CBRN respirators are Open-Circuit, Self-Contained Breathing Apparatus (SCBA); tight-fitting, full face Air-Purifying Respirator (APR/ Gas Mask); and Air-Purifying Escape Respirators (APER).

Remember:

- The time period is *six continuous hours*, not a sum of smaller time periods of intermittent use. Re-use of hardware after 6 hours of being contaminated is not recommended.
- At the six-hour mark, the entire SCBA must be decontaminated and disposed of properly to include the cylinder neck valve assembly.
- The SCBA or any portion of the SCBA contaminated with chemical warfare agents cannot be reused following the six-hour period. While the hardware of the CBRN SCBA has an in-use life of six hours when it has been exposed to suspected or known CWA contamination, the duration of available breathable air is dictated by the type of air cylinder used. Availability of spare cylinders, complete CBRN SCBA, and manpower will dictate the effective response time and resources available to respond. Use of non-CBRN protected SCBA is not recommended for a CBRN response. While their use will be inevitable, NIOSH traditional SCBA use on a CBRN incident site may contribute to additional casualties, unless appropriate contamination avoidance measures are enforced.



Hot zone evacuation of training casualty by responders wearing Level B and Level C respiratory and dermal personal protective equipment. Photo is courtesy of Terrence K. Cloonan, NPPTL, and Raymond V. DeMichiei, Deputy Director/WMD Coordinator, City of Pittsburgh, 2005.

Step 6 FACEPIECE INDICATORS OF CONCERN

You may have donned the SCBA facepiece incorrectly if:

A) The facepiece is fogged over and you are "On-Air":

Corrections

- Use anti-fog solution in advance
- Redon the facepiece- if a suit is worn, ensure the suit hood is overtop of the head harness.
- Check that the air is fully turned on
- Seek training or re-training on use of Heads-Up-Display (HUD)
- Low pressure in cylinder— seek recharge
- If fogging still continues while on air, doff in a clean area and evaluate the proper fit of the face-to-facepiece seal relating to size, fit test, facial hair or hairline, or any other factors related to size, make, model, or comfort of the respirator.



Figure 9. Generic Mask-Mounted Regulator CBRN SCBA Schematic. Courtesy of MSA, Terrence K. Cloonan, NPPTL, and Marion Molchen, KI, LLC., 2006.

B) The second stage regulator or air hatch will not operate correctly or mate properly with the facepiece. In a clean atmosphere conduct the following recommended actions:

Corrections

- Disconnect and reconnect the regulator per manufacturer instructions or manually open and close the air hatch
- Ensure facepiece matches make and model of regulator/SCBA. Use the NIOSH paper matrix label to confirm the part numbers are compatible and CBRN approved
- Ensure locking mechanisms are fully seated and not broken
- Ensure debris is not in the facepiece or regular connection ports

C) Heads up display (HUD) is not working:

Corrections

- Inspect the HUD for damage
- Ensure the batteries are serviceable
- Reconnect the second stage regulator to the facepiece to ensure that it is correctly attached
- Ensure the electronic connections of the HUD are clean

Step 7 HAVE A DECONTAMINATION PLAN

The CBRN SCBA six-hour continuous use life concept is mandatory and includes the decontamination process (decon) but not the disposal of CBRN SCBA, following use in a CWA incident.

AIHA Guideline 6-2005, *Guideline for the Decontamination of Chemical Protective Clothing and Equipment*, and the OSHA/NIOSH CBRN PPE selection matrix located at <http://www.osha.gov/SLTC/emergencypreparedness/cbrnmatrix/index.html> are technical resources to assist responders preparing for CBRN agent decontamination planning and operations.

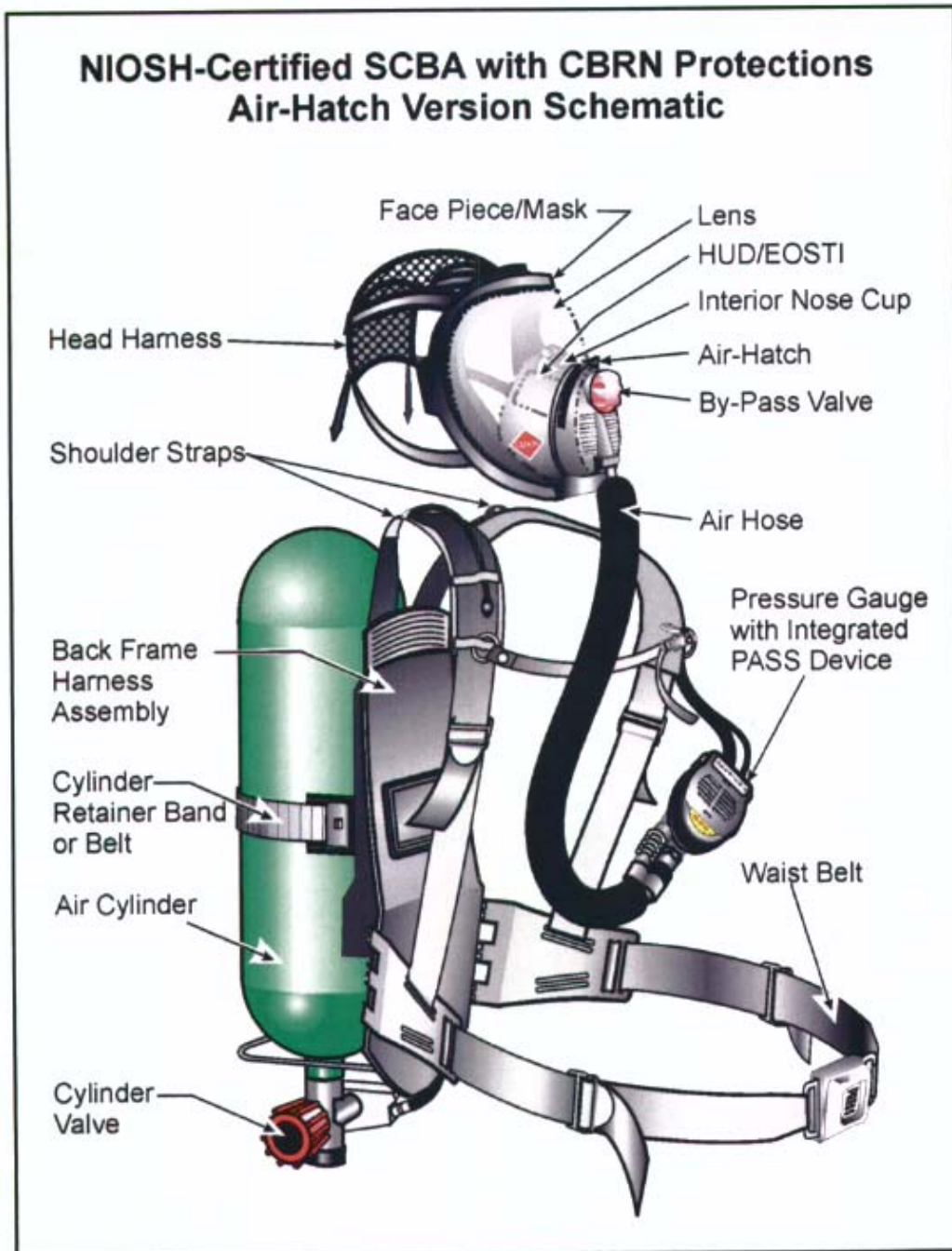
If known or suspected CBRN contamination is present on the SCBA, quickly conduct emergency or gross, wet or dry, decontamination, followed by technical decontamination, using all available methods; such as ladder truck decon or other field expedient decon operations using high volume, low pressure, clean tepid water to reduce surface CBRN agent contamination. Responders should conduct three separate consecutive water applications per station. Do not remove contaminated respirator facepiece during the decontamination process until instructed by a qualified responder or for extenuating life safety reasons. Utilize 5% common bleach solution as a supplemental decontamination solution, determine run-off wash contamination toxicity, and implement local prevention measures to preserve and protect responders, the public, municipal infrastructure, and the environment from the anticipated or known effects of CBRN run-off waste products. Certain chemical warfare agents may not be neutralized, and others may be hydrolyzed or diluted while being physically washed off equipment surfaces. Contamination avoidance, sampling, monitoring, mitigation, and decontamination practices should be planned out and trained in advance. All SCBA used in a CBRN incident response must be determined clean or hazardous, and if hazardous, discarded in accordance with local regulatory requirements. If time permits, users should ensure that known or potentially contaminated CBRN SCBA or traditional SCBA are double-bagged in plastic, labeled with the type of contamination, the amount/type of decontamination solution used, and the technique used to conduct gross and technical decontamination. The contamination time for SCBA and the amount of CBRN contamination is also beneficial information, relative to disposal. Repeatable quantification CBRN detection methods are required. A decontamination method specific to the type of CBRN agent contamination may contribute to the increased efficacy of decontamination operations. Seek specific current guidance from the local incident commander, state public health department, lead federal agency onsite, or visit one of the CDC links located at <http://www.bt.cdc.gov/agent/sarin/erc107-44-8pr.asp> for additional guidance.

Accurate detection of CBRN agents on SCBA is situational dependent and subject findings of qualified, quantitative method analysis and identification by the lead federal agency.



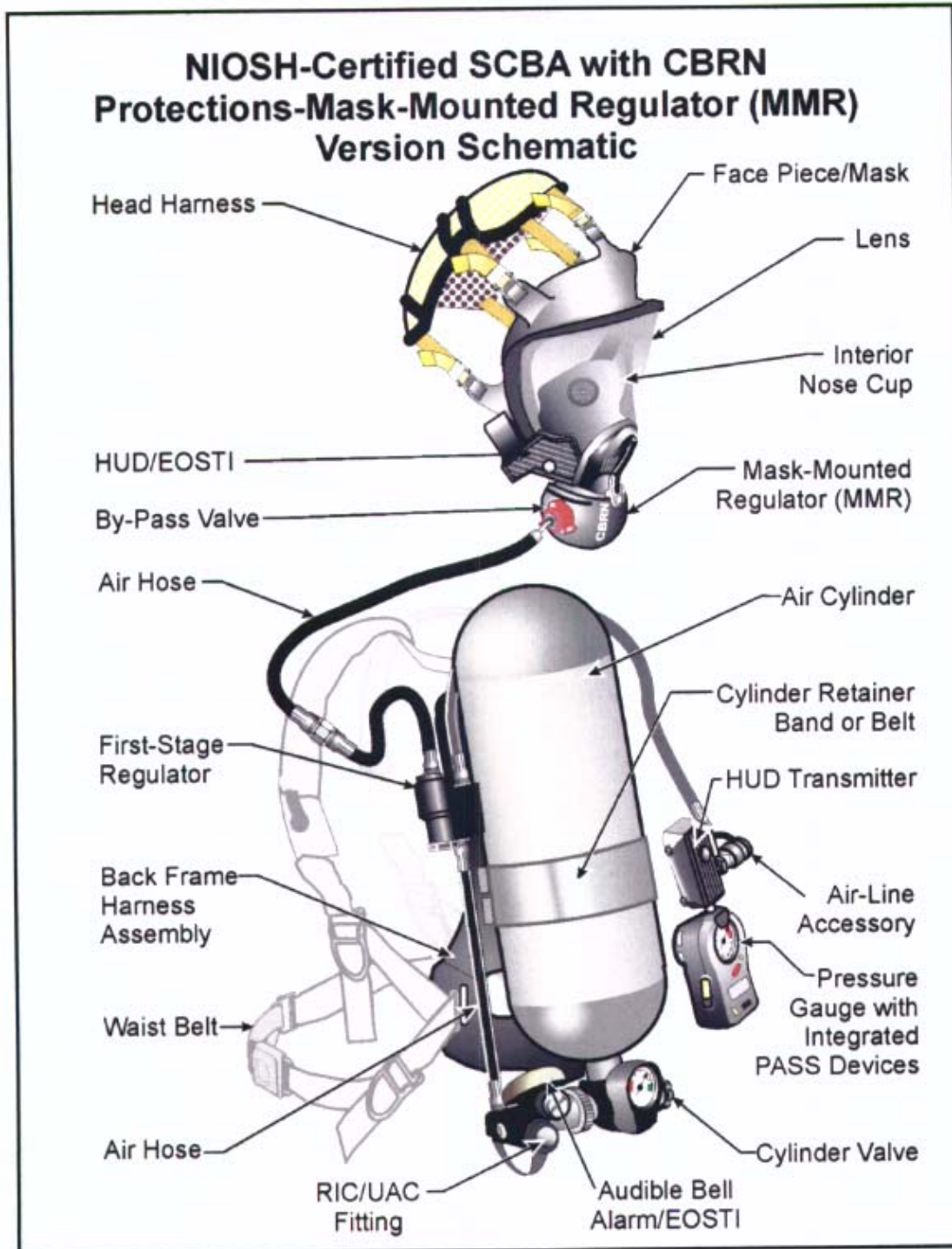
Photograph depicts firefighters conducting CBRN gross decontamination training in level D turn-out gear and Level B SCBA respiratory protection. Photograph courtesy of Terrence K. Cloonan, NPPTL, Jack Hagerty, NIOSH, and Raymond V. DeMichiei, Deputy Director/ WMD Coordinator, City of Pittsburgh, PA, 2005.

Appendix A: Air-Hatch Label Call-Out



Generic drawing of Air-Hatch, Open Circuit, CBRN SCBA. Schematic courtesy of Terrence K. Cloonan, NPPTL, ISI, and Marion Molchen, KI, LLC., 2005.

Appendix B: Mask-Mounted Regulator Label Call-Out



Generic drawing of Mask-Mounted Regulator, Open Circuit, CBRN SCBA. Schematic courtesy of Terrence K. Cloonan, NPPTL, MSA, and Marion Molchen, KI, LLC., 2006.

Appendix C: References

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This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

CBRN SCBA TRAINING AID DVD

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Photograph depicts a two-man law enforcement sniper team in Level B protection during a CBRN barricaded suspect apprehension training mission. The SCBA are in rip-stop cloth concealment shrouds on the left of the photograph. The photograph is courtesy of Terrence K. Cloonan, NPPTL, LT Ed Allen, NTOA, and LT Jerry Schiager, Fort Collins Police Department, CO, May 2005.

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